

Appl. No. 09/905,566  
Amdt. Dated February 18, 2005  
Reply to Office Action of October 19, 2004

**Amendments to the Claims:**

This listing will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Currently amended): A method of modifying fluid flow in a channel formed in a substrate which comprises: exposing ~~a portion~~ only one or more discrete, isolated portions of the channel to light at a fluence which is sufficient to change a surface charge at the one or more discrete, isolated exposed ~~portion~~ portions of the channel.

Claim 2 (Currently amended): A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein ~~the fluence does not cause ablation of the substrate~~ a portion of the channel is exposed to light at a fluence and wavelength(s) which are sufficient to alter the surface charge at the exposed portion of the channel, and wherein the substrate is not ablated by the light.

Claim 3 (Original): A method of modifying fluid flow in a channel formed in a substrate according to claim 1, wherein the fluence causes ablation of the substrate.

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Claim 4 (Currently amended): A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the one or more discrete, isolated portions ~~portion~~ of the channel which is exposed to light comprises at least one of a wall of the channel, a bottom of the channel, and one or more portions thereof.

Claim 5 (Currently amended): A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the channel is linear.

Claim 6 (Currently amended): A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the channel is non-linear.

Claim 7 (Currently amended): A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the one or more discrete, isolated portions ~~portion~~ of the channel is exposed to at least one of a linear and non-linear pattern of light.

Claim 8 (Currently amended): A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the substrate is a member selected from the group consisting of polymeric, glass, silica, ceramic, ~~or~~ and composites thereof.

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**Claim 9 (Currently amended):** A method of modifying fluid flow in a channel formed in a polymeric substrate according to claim 3, wherein the substrate is selected from the group consisting of a poly(methyl methacrylate) substrate, a polycarbonate substrate, a poly(ethylene terephthalate glycol) substrate, a polystyrene substrate, and a poly(vinyl chloride) substrate.

**Claim 10 (Currently amended):** A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the substrate comprises a microfluidic system.

**Claim 11 (Withdrawn):** A method of immobilizing a chemical species in a channel formed in a substrate which comprises: exposing a portion of the channel to light at a fluence which is sufficient to change a surface charge at the exposed portion of the channel; and applying a chemical species to the exposed portion of the channel.

**Claim 12 (Withdrawn):** A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the chemical species comprises a chemical compound.

**Claim 13 (Withdrawn):** A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the chemical species comprises a biological species.

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**Claim 14 (Withdrawn):** A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the portion of the channel that is exposed to the light comprises at least one of a wall of the channel, a bottom of the channel, and portions thereof.

**Claim 15 (Withdrawn):** A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the substrate is a member selected from the group consisting of polymeric, glass, silica, ceramic, or composites thereof.

**Claim 16 (Withdrawn):** A method of immobilizing a chemical species in a channel formed in a polymeric substrate according to claim 11, wherein the substrate is selected from the group consisting of a poly(methyl methacrylate) substrate, a polycarbonate substrate, a poly(ethylene terephthalate glycol) substrate, a polystyrene substrate, and a poly(vinyl chloride) substrate.

**Claim 17 (Withdrawn):** A method of immobilizing a chemical species in a channel formed in a substrate according to claim 11, wherein the substrate comprises a microfluidic system.

**Claim 18 (Withdrawn):** A method for immobilizing a chemical species in a channel formed in a substrate according to claim 17, wherein a microarray is formed in the microfluidic system.

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**Claim 19 (Withdrawn):** In a microfluidic system comprising a substrate having a fluid flow channel, the improvement comprising a portion of the fluid flow channel which has been surface-charged modified by exposure to light.

**Claim 20 (Withdrawn):** The microfluidic system according to claim 19, wherein the fluid flow channel has at least one linear or non-linear portion which has been surface charged modified by exposure to light.

**Claim 21 (Withdrawn):** The microfluidic system according to claim 19, wherein the portion of the fluid flow channel which has been surface modified by exposure to light has not been ablated by the exposure to light.

**Claim 22 (Withdrawn):** The microfluidic system according to claim 19, wherein the portion of the fluid flow channel which has been surface modified by exposure to light has been ablated by the exposure to light.

**Claim 23 (Withdrawn):** The microfluidic system according to claim 22, wherein a chemical compound or biological species is immobilized at the modified portion of the fluid flow channel.

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**Claim 24 (Withdrawn):** The microfluidic system according to claim 21, wherein a chemical compound or biological species is immobilized at the modified portion of the fluid flow channel.

**Claim 25 (New):** A method of modifying fluid flow in a channel formed in a substrate according to claim 2, wherein the portion of the channel which is exposed to light comprises at least one of a wall of the channel, a top of the channel, a bottom of the channel, and portions thereof.

**Claim 26 (New):** A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the channel is linear.

**Claim 27 (New):** A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the channel is non-linear.

**Claim 28 (New):** A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the portion of the channel is exposed to at least one of a linear and non-linear pattern of light.

**Claim 29 (New):** A method of modifying fluid flow in a channel formed in a substrate according

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to claim 3, wherein the substrate is a member selected from the group consisting of polymeric, glass, silica, ceramic, or composites thereof.

Claim 30 (New): A method of modifying fluid flow in a channel formed in a polymeric substrate according to claim 3, wherein the substrate is selected from the group consisting of a poly(methyl methacrylate) substrate, a polycarbonate substrate, a poly(ethylene terephthalate glycol) substrate, a polystyrene substrate, and a poly(vinyl chloride) substrate.

Claim 31 (New): A method of modifying fluid flow in a channel formed in a substrate according to claim 3, wherein the substrate comprises a microfluidic system.